

# **LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES**



**OFFICE OF FISHERIES  
INLAND FISHERIES SECTION**

**PART VI -B**

**WATERBODY MANAGEMENT PLAN SERIES**

**BAYOU BONNE IDEE**

**WATERBODY EVALUATION &  
RECOMMENDATIONS**

# **CHRONOLOGY**

DOCUMENT SCHEDULED TO BE UPDATED EVERY THREE YEARS

December, 2008 - Prepared by  
Jesse Bahm, Biologist Manager, District II

February, 2013 – Updated by  
Ryan Daniel, Biologist Manager, District II

February, 2016 – Updated by  
Ryan Daniel, Biologist Manager, District II

The remainder of this page left intentionally blank.

# TABLE OF CONTENTS

<b>WATERBODY EVALUATION.....</b>	<b>4</b>
<b>STRATEGY STATEMENT .....</b>	<b>4</b>
<i>Recreational.....</i>	<i>4</i>
<i>Commercial .....</i>	<i>4</i>
<i>Species of Special Concern.....</i>	<i>4</i>
<b>EXISTING HARVEST REGULATIONS .....</b>	<b>4</b>
<i>Recreational.....</i>	<i>4</i>
<i>Commercial .....</i>	<i>4</i>
<b>SPECIES EVALUATION.....</b>	<b>4</b>
<i>Recreational.....</i>	<i>4</i>
<i>Commercial .....</i>	<i>9</i>
<b>HABITAT EVALUATION .....</b>	<b>9</b>
<i>Aquatic Vegetation .....</i>	<i>9</i>
<i>Aquatic Vegetation Status: .....</i>	<i>10</i>
<i>Substrate.....</i>	<i>11</i>
<i>Artificial Structure .....</i>	<i>11</i>
<b>CONDITION IMBALANCE / PROBLEM .....</b>	<b>11</b>
<b>CORRECTIVE ACTION NEEDED .....</b>	<b>12</b>
<b>RECOMMENDATIONS .....</b>	<b>12</b>
<b>APPENDIX I – AREA MAP.....</b>	<b>14</b>

# WATERBODY EVALUATION

## STRATEGY STATEMENT

### Recreational

Sportfish species are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest numbers of fish adequate to maintain angler interest and efforts.

### Commercial

The physical characteristics of Bayou Bonne Idee do not support the large rough fish species that normally comprise a commercial fishery; therefore, a commercial fishery strategy is not used.

### Species of Special Concern

No threatened or endangered fish species are found in this waterbody.

## EXISTING HARVEST REGULATIONS

### Recreational

Statewide regulations for all fish species; recreational fishing regulations may be viewed at the following web address: <http://www.wlf.louisiana.gov/regulations>

### Commercial

Commercial fishing regulations may be viewed at the following web address: <http://www.wlf.louisiana.gov/regulations>

### Parish Regulations

Only statewide regulations apply to this waterbody.

## SPECIES EVALUATION

### Recreational

Largemouth bass are targeted as a species indicative of the overall fish population due to their high position in the food chain. Electrofishing is the best indicator of largemouth bass abundance and size distribution, with the exception of large bass. Gill net sampling is used to determine the status of large bass and other large fish species. Shoreline seining is used to collect information related to fish reproduction.

## *Largemouth Bass*

### Relative abundance and size structure-

In the chart below (Figure 1), fall electrofishing data is used as an indicator of largemouth bass abundance with total catch per unit effort (CPUE) (bass captured per hour of electrofishing) indicated since 1992. Restocking occurred in 1994 after repairs were made on the downstream weir. Catch per unit effort has remained stable since the restocking event occurred. Some of the sample-to-sample variation may be explained by sampling error. Figure 2 depicts the size (length) distribution of the largemouth bass population estimated from spring and fall electrofishing in 2012. Most size classes are represented, which indicates that recruitment has been stable. The entire catch per unit effort rates were 30.5 and 25.9 bass per hour for spring and fall, respectively.

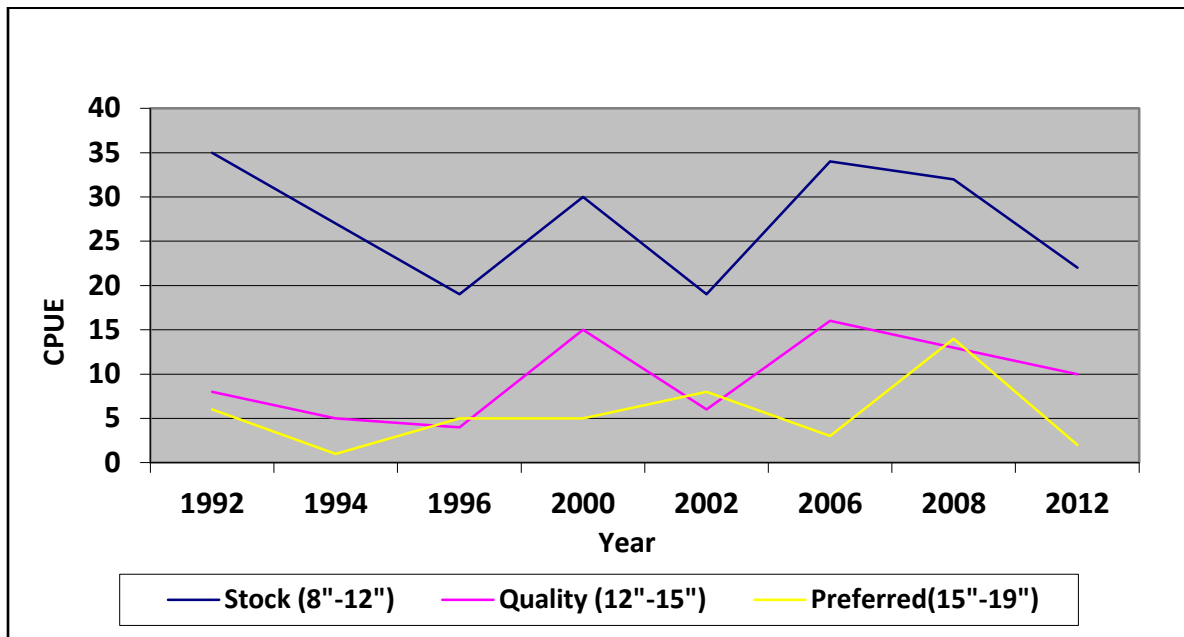


Figure 1. Catch per unit effort of stock, quality, and preferred size classes of largemouth bass from fall electrofishing samples on Bayou Bonne Idee, 1992 – 2012.

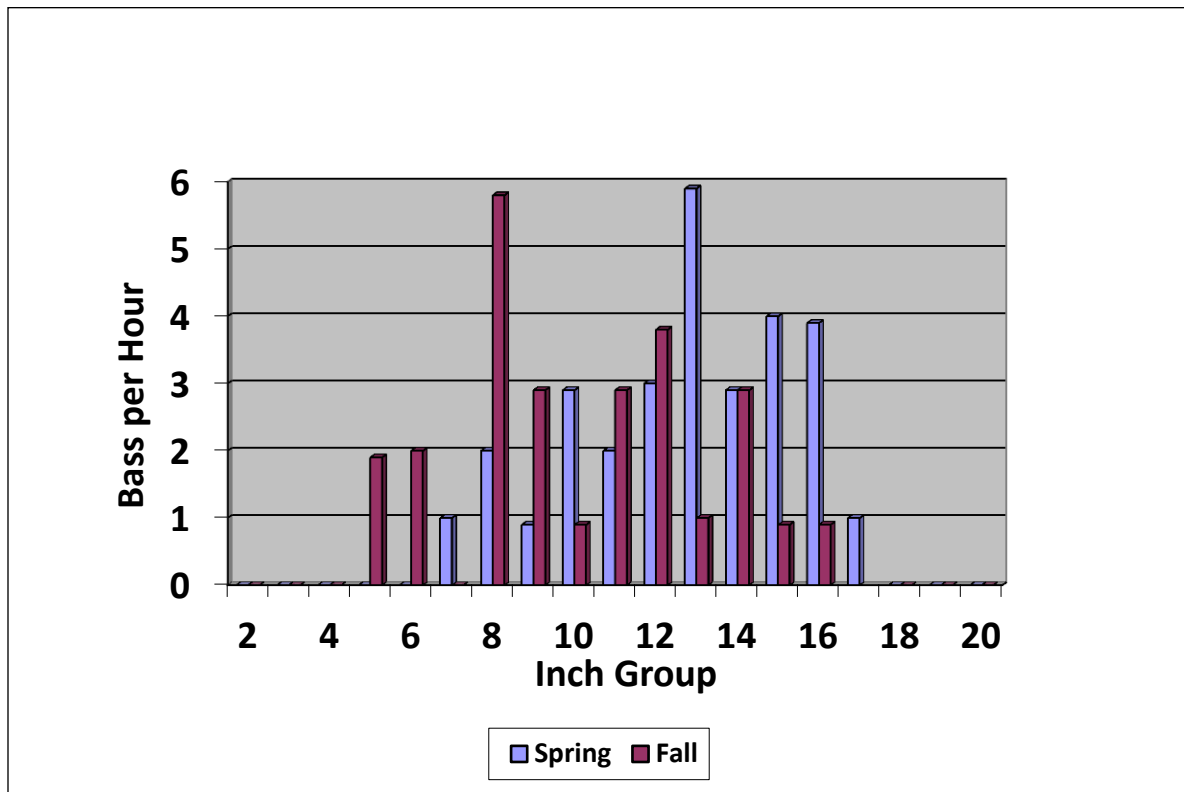


Figure 2. The size distribution (inch groups) of largemouth bass from spring and fall electrofishing results on Bayou Bonne Idee, 2012.

### Forage

Sunfish *Lepomis* spp., silversides *Labidesthes* spp., and shad *Dorosoma* spp. have been identified as the primary bass forage species in Bayou Bonne Idee. Forage availability is measured through shoreline seine sampling, electrofishing, and indirectly through measurement of largemouth bass body condition or relative weight. Relative weight (Wr) is the ratio of a fish's weight to the weight of a "standard" fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length, and multiplying the quotient by 100. Low largemouth bass relative weights below 80 indicate a potential problem with forage availability. Bayou Bonne Idee relative weights are typically 100 for all size groups, which means these fish have an adequate forage base (Figure 3). Bluegill (*Lepomis macrochirus*) and shad were the most abundant species collected in an electrofishing forage sample taken in fall, 2012. Catch per hour rates for these species were 432 and 144, respectively.

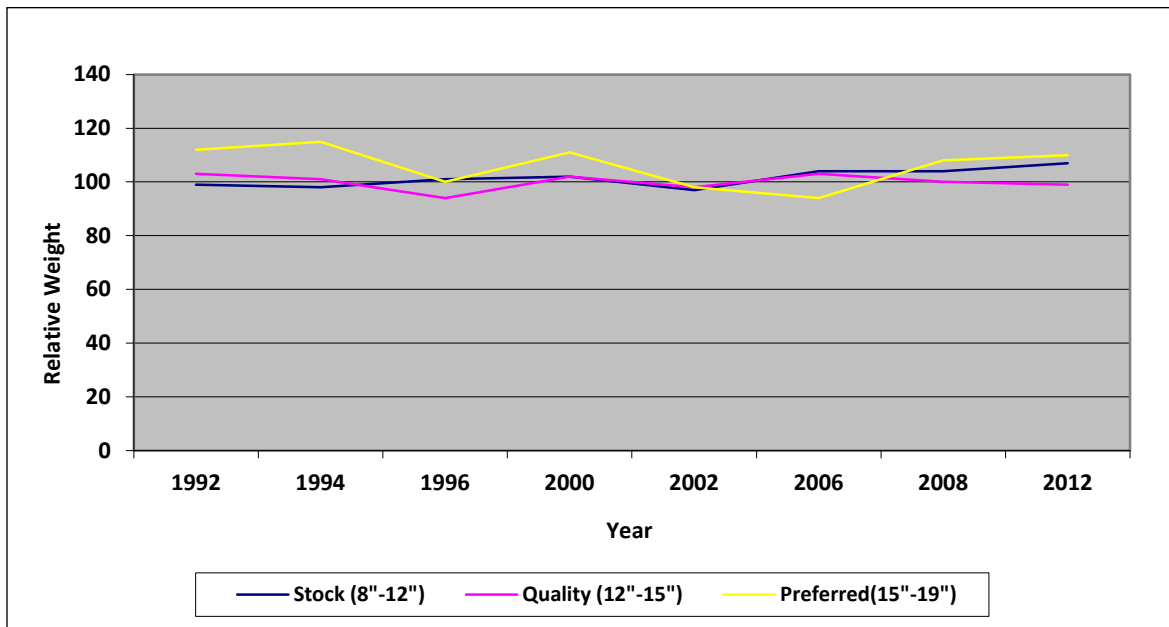


Figure 3. Relative weight of stock, quality, and preferred size classes of largemouth bass from fall electrofishing on Bayou Bonne Idee, 1992 – 2012.

Seine haul samples were taken at four boat ramps in the summer of 2013 to evaluate sportfish reproduction and forage availability. A total of four sunfish species were captured in addition to two shad and three minnow species. All fish collected were less than 4 inches and considered to be adequate forage for larger predator species. Table 1 below provides a summary of this sample.

Table 1. Catch per seine haul of all species captured during seine sampling of Bayou Bonne Idee in summer 2013,  $n=4$ .

Species	Catch per Seine Sample
Largemouth Bass	1.75
Bluegill	54.25
Redear Sunfish	0.25
Longear Sunfish	8.75
Orange-spotted Sunfish	2.50
Gizzard Shad	0.75
Threadfin Shad	8.25
Silvery Minnow	0.75
Bullhead Minnow	3.00
Western Mosquito Fish	3.50

### *Crappie and Other sunfish species*

From 1965 through 1994, biomass (rotenone) sampling was used to indicate status of crappie and sunfish populations in Bayou Bonne Idee. Total weight of non-predatory game fish (sunfish) ranged from 1.2 – 76.3 pounds per acre with a yearly average of 22 lbs per acre.

Crappie ranged from 0 – 72.2 pounds per acre with a yearly average of 22 lbs. per acre. Beginning in 2005, crappie and sunfish sampling was conducted using standardized lead nets. Relative weights were only used from white crappie *Pomoxis annularis* because of the limited number of black crappie captured. White crappie relative weights were low in 2005 and 2008 (Figure 4). Many of the fish had relative weights between 80 and 90 percent. In 2008, all of the fish less than 8 inches total length (TL) had relative weights less than or equal to 90 percent. Also in 2008, fish greater than 8 inches TL had relative weights at or above 100. Forage is likely the limiting factor for the smaller age classes. Forage may be reduced by the low water levels that occur in the summer months due to agricultural irrigation.

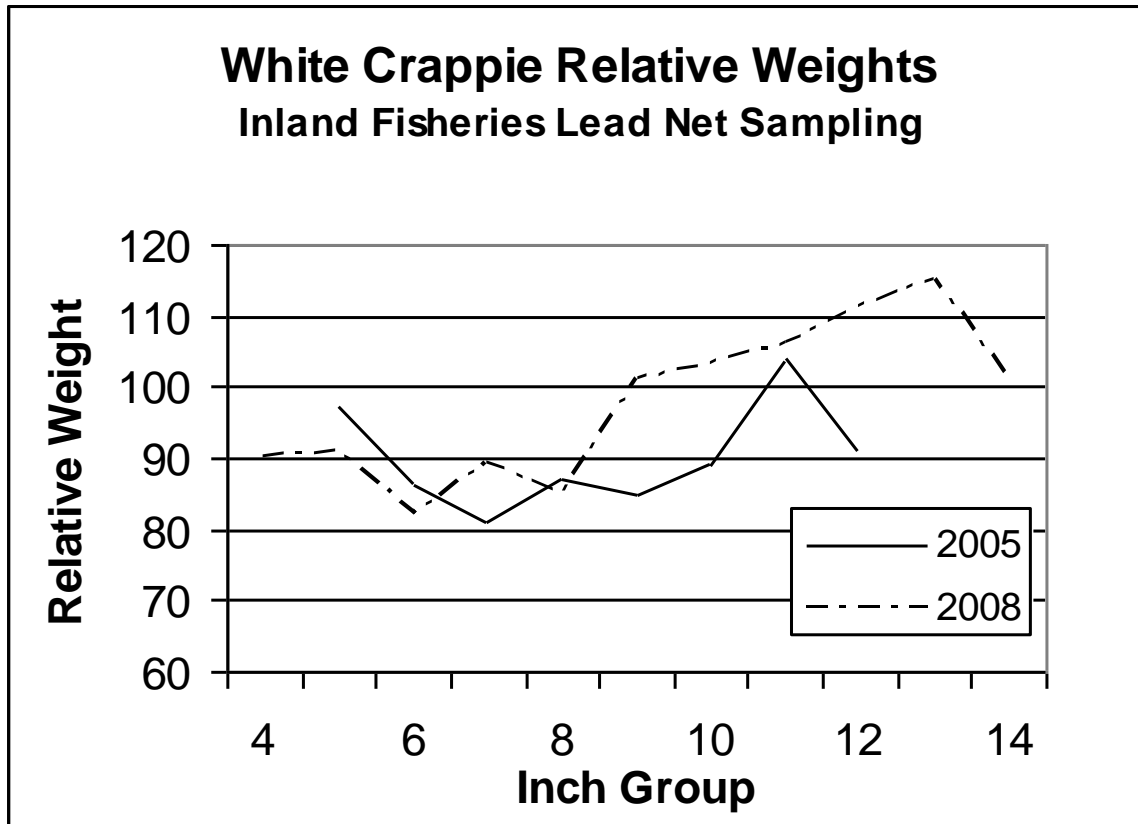


Figure 4. The relative weights of white crappie from Bayou Bonne Idee, Louisiana for 2005 and 2008 fall lead net sampling.

Lead net sampling in 2012 revealed an abundance of white crappie, with the size distribution skewed toward smaller size fish (Figure 5). The majority of these fish were most likely young-of-year (YOY), indicating a successful spawn in spring 2012. The proportional stock density (PSD) value from this sample was 10, which is lower than desirable. This means that of all crappie over five inches TL, only 10% were over the quality size of eight inches TL. The desirable range is 30 – 60. In contrast, the PSD value from the 2008 sample was 56. The overall CPUE for this sample was 1.05, whereas the 2008 sample was 0.42 crappies per hour. Black crappie *P. nigromaculatus* were also present, though they represented a very small percentage of the crappie population. This is to be expected from a waterbody with frequent turbidity, such as Bayou Bonne Idee.



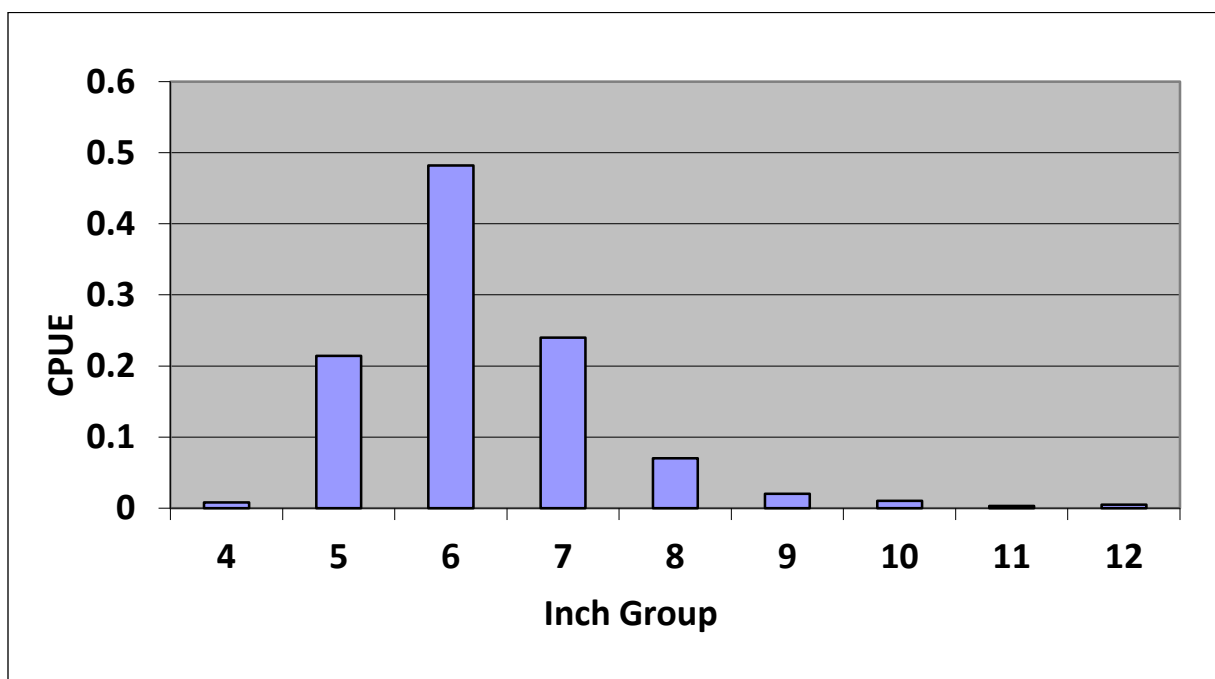


Figure 5. The size (length group) distribution of white crappie from lead net sampling results on Bayou Bonne Idee 2012. The majority of the fish were YOY recruits.

#### Commercial

Large rough fish species that normally comprise a commercial fishery are not found in high enough densities to support commercial harvest. A gill net sample taken during winter of 2013 revealed a low abundance of commercial species (Table 2).

Table 2. Total CPUE (number per 100 ft. net per net night) of commercial species captured during gill net sampling in Bayou Bonne Idee in winter 2013,  $n=3$ .

Species	Total CPUE
Black Buffalo	0.01
Common Carp	0.01
Silver Carp	0.01
Channel Catfish	0.06
Spotted Gar	0.03
Gizzard Shad	0.04

## **HABITAT EVALUATION**

#### Aquatic Vegetation

Near the shoreline there are bald cypress and water tupelo. Submerged vegetation includes coontail *Ceratophyllum demersum*, fanwort *Cabomba caroliniana*, and bladderwort

*Utricularia* spp. The complex cover in Bayou Bonne Idee is declining, which makes the native vegetation extremely important fish habitat. Water hyacinth *Eichhornia crassipes* has been a common problem along the bayou. In 1998, the hyacinth was so severe that spray crews (seven) from throughout the state were deployed for spraying operations to reduce vegetation to a more manageable level. In recent years, the floating plant duckweed *Lemna* spp. has become problematic at times, with large surface mats forming in various areas on Bayou Bonne Idee. Most of the problems occur in the two northernmost sections of the bayou. No aquatic type maps or biomass sampling have been conducted to date. Table 1 lists the acres of nuisance vegetation in Bayou Bonne Idee treated with herbicides during 2013, 2014 and 2015. A list showing acreage sprayed since 2005 can be seen in the Bayou Bonne Idee Management Plan Part A (updated February 2016).

Table 1. Total acres of nuisance aquatic vegetation treated with herbicides on Bayou Bonne Idee in 2013 and 2015.

Year	Species				
	Alligator weed	Duckweed	Water Hyacinth	Water pennywort	Water primrose
2013	449	32	120	16	28
2014	147	-	5	-	55
2015	186	-	-	-	38

A containment boom was placed north of Hwy. 2 in the spring of 2013 in an effort to reduce the spread of duckweed downstream. Much of the duckweed in Bayou Bonne Idee originates in the forested upper reaches. The effort produced mixed results and the boom was removed later that year.

## Aquatic Vegetation Status:

### General:

Coverage of floating and emergent aquatic vegetation in Bayou Bonne Idee occasionally poses a threat to fisheries habitat, navigation, and shoreline property owners. The emergent species alligator weed and water primrose were the most troublesome species in 2014 & 2015, though no serious infestations occurred. A few complaints were made by homeowners concerning extensive growth of alligator weed around private piers. Duckweed and water hyacinth coverage was much lower than in past years.

### Coverage and Status of Problem Plant Species in 2015

Alligator weed – abundant, commonly extending greater than 20 ft. from shoreline and entirely covering some shallow pockets; found throughout the lake.

Water hyacinth – common throughout, forming surface mats in some protected coves; total coverage not problematic.

Duckweed – common, most abundant in the upper reaches, no significant surface mats formed in 2014.

### Coverage and Status of Beneficial Plant Species in 2015

Coontail – common in most areas of the lake, though there are no dense stands; coverage is considered near optimal or slightly below for fisheries habitat.

#### Aquatic Vegetation Prediction for 2016

Coverage of all aquatic species is predicted to be similar to amounts observed in 2014 and 2015. The frequency and duration of sub-freezing temperatures during the winter will affect the total coverage of emergent and floating species in the upcoming spring. The issue of overabundant aquatic vegetation, particularly invasive species, is currently an issue on Bayou Bonne Idee and is likely to continue because of its shallow waters and limited flow. No severe infestations are predicted.

#### Aquatic Vegetation Management

Control of nuisance aquatic vegetation will continue to be necessary on Bayou Bonne Idee. Timely herbicide applications will be the primary means of control. Water hyacinth and duckweed are currently the species of most concern. When either species reaches significant amounts, especially in residential areas, or where it may be impeding flowage or navigation, herbicide applications will be necessary to minimize the coverage. Alligator weed may also require control, especially in shallow areas where it could impede navigation and lower the quality of shallow fish habitat. Specific herbicide treatments are given below in Recommendations.

#### Substrate

The silt loam substrate provides suitable spawning habitat throughout the Bonne Idee.

#### Artificial Structure

Bayou Bonne Idee has adequate natural complex cover but it is declining. At this time no artificial structure is necessary.

### **CONDITION IMBALANCE / PROBLEM**

The major problem on Bayou Bonne Idee is the repeated drawdown of the lake by agricultural irrigation. The most dramatic drawdowns occur during dry summers and they can nearly dewater the northernmost lake. These frequent summer drawdowns are likely having a negative impact on fish recruitment and reproduction. Another problem is the regularly occurring infestation of duckweed, which benefits from the bayou-like properties of the lake. The duckweed originates in the narrow, upper reaches where cypress trees *Taxodium distichum* form dense thickets. Rainfall will provide temporary flow, which moves the duckweed downstream where it will often accumulate near residential areas. The large mats have created anoxic conditions beneath them and have been a contributor to naturally caused fish kills. Silver carp *Hypophthalmichthys molitrix*, an invasive species, have recently been observed in Bayou Bonne Idee. The impact of these fish on the native fish population is unknown and they also cause a danger to boaters because of their notorious habit of leaping out of the water when disturbed by passing boats.

## CORRECTIVE ACTION NEEDED

Reducing the amount of water used from Bayou Bonne Idee to irrigate nearby agriculture land would provide for a healthier fish population. A more efficient method of duckweed control is needed to reduce the impact to the fisheries and shoreline property owners. The use of a containment boom is recommended to prevent duckweed from flowing out of the upper reaches of the lake. It will also provide an accumulation of duckweed, where it will become more efficient to treat with herbicides. See the Recommendations section below for details. It is unknown where the silver carp entered Bayou Bonne Idee. Measures should be taken to prevent further introduction and remove those that are currently in the lake.

## RECOMMENDATIONS

Unfortunately, there is limited potential to reduce the amount of water used by nearby farms. Discussions have been made by the Bayou Bonne Idee Gravity Drainage Board to pump water from Bayou Bartholomew into Bayou Bonne Idee during dry periods to provide adequate water for agricultural lands and limit the scale of the summer drawdowns.

1. Water should not be pumped into Bayou Bonne Idee because the introduction of nuisance species (Asian carp) is imminent. Bayou Bonne Idee has experienced low water levels for many years and the fishery has remained relatively stable. The introduction of Asian carp will likely have a much more negative impact on the fishery than the current drawdowns.
2. Continue existing recreational and commercial harvest regulations until LDWF sampling results indicate that change is appropriate and necessary from a biological perspective or such time as a change in management strategy is indicated by the collective opinion of Bayou Bonne Idee anglers.
3. Continue scheduled standardized sampling of fish populations and aquatic vegetation to determine status over time. Include evaluation of crappie and sunfish populations with the use of standardized lead nets.
4. Plan meetings on at least an annual basis with the Morehouse Parish Police Jury or their representative to discuss management and to share ideas and information.
5. Continue routine spraying of duckweed and water hyacinth where it regularly forms large mats. Duckweed will be treated with spray applications of **diquat dibromide** at a rate of 1 gal. per acre. Other nuisance emergent and floating vegetation should be treated as required with the following herbicides: **2,4-D** (except 3/15 – 9/15) at 0.5 gal/acre for water hyacinth, American lotus, and alligator weed, **glyphosate** at 0.75 gal/acre for American lotus, water pennywort, alligator weed, and parrot's feather. **Triclopyr** (Renovate) and **imazapyr** (Habitat) may be more effective on alligator weed, primrose, and parrot's feather but have irrigation restrictions. **Ammonium salt of imazamox** (Clearcast) may be used near residential areas and pump intakes. These herbicides are typically applied at a rate of 0.5 gal./acre and combined with 0.25 gal/acre of Turbulence

surfactant.

If floating vegetation becomes excessive north of Hwy. 2, deploy a containment boom in a location in the upper section near the Azalea Bridge to prevent excessive amounts of duckweed or water hyacinth from flowing south of this location, where it will impact fisheries habitat, recreational access and homeowners. It should be positioned in a manner to allow boat traffic and to maximize the accumulation of duckweed on the upstream side. It should also have no negative impacts to private property. The area should then be treated regularly with appropriate herbicides. The frequency of treatments will be known soon after boom deployment. A boom was deployed in this area in 2013, though it was removed soon thereafter for use in a more critical location on another waterbody.

6. Monitor silver carp populations through the use of gill net sampling and remove all that are captured.

## APPENDIX I – AREA MAP

